Putting Research to Work

RD&T E-Newsletter, October 2003

Technical information for state DOT highway professionals

Prepared by CTC & Associates LLC

Nina McLawhorn
Research Administrator
Wisconsin Department
of Transportation
608-266-3199
nina.mclawhorn@dot.state.wi.us

Research World

WisDOT Cited for Role in Regional Traveler Information Web Site

The Gary-Chicago-Milwaukee travel Web site, created with the help of Wisconsin, Indiana and Illinois DOTs, recently drew FHWA recognition for excellence, according to the TRB E-Newsletter. The site includes maps, construction reports, travel times and more. See FHWA's press release at http://www.fhwa.dot.gov/pressroom/fhwa0328.htm and the GCM Web site at http://www.gcmtravel.com/gcm/home.jsp.

New 2003 Urban Mobility Study: Remedies Working – Congestion Still Growing

Traffic congestion nationwide continues to worsen, but the burden would be far greater without a handful of remedies already in place, according to the nation's longest running study of traffic jams. The annual Urban Mobility Report, published by the Texas Transportation Institute, this year measures the effect of five congestion remedies in the cities where they are being used.

- The effect of public transportation service
- Bus and carpool lanes
- Traffic signal coordination
- Freeway incident management (clearing crashes and disabled vehicles)
- Freeway entrance ramp meters (signals that regulate traffic flow onto the freeway)

According to researcher Tim Lomax, a new set of mobility measures that gauge traffic problems and their potential solutions show that:

- "First of all, we can save a significant amount of [travelers'] time with solutions we now have available, and we can do so at a cost that's very low in comparison to what it costs to build a transportation system."
- "But second, even with widespread use of cost-effective solutions, we need to add more capacity, manage the demand and seek improvements in land development patterns as well."

See TTI's September 30, 2003 press release at http://mobility.tamu.edu/ums/news_release/ and follow links to the full report and detailed tables, such as city-by-city congestion data at http://mobility.tamu.edu/ums/mobility_data/ and national comparisons at http://mobility.tamu.edu/ums/appendix_a/.

China: New Transportation/Logistics Society Launches

A new organization in China will promote national and international exchanges and cooperation in the transportation and logistics industries, and will serve as a bridge between domestic and foreign technology developers and enterprises, investors and builders. The Society of Transportation & Logistics was established to meet the ever-increasing demands of China's rapidly developing transportation and logistics industries.
http://www1.chinadaily.com.cn/en/doc/2003-09/06/content_261846.htm

---

To receive **Putting Research to Work** each month, send e-mail to wisdotresearch@dot.state.wi.us with "Subscribe RD&T E-Newsletter" in the subject field. To discontinue, include "Unsubscribe RD&T E-Newsletter" in the subject field.

Other e-newsletters for transportation professionals: Transportation Research Board http://gulliver.trb.org/news/. Transportation Communications Newsletter http://groups.yahoo.com/group/transport-communications/.

Designing for the Future

Reaching Out: Public Involvement Strategies

Involving the public in transportation facility planning can be a delicate proposition. This FHWA case study on public involvement strategies spotlights both traditional and innovative approaches. In one example, highway planners in Kentucky tested several visualization and preference analysis techniques while soliciting public input on roadway design features. Read about lessons other agencies have learned at http://www.fhwa.dot.gov/tcsp/case8.htm.

Crash Test Facility to Focus on Roadside Structures

Construction is beginning on a new U.S. DOT crash test facility on the campus of George Washington University in Ashburn, Va. The facility will use advanced computer programs to simulate traffic accidents involving highway infrastructure, research that will help states design safer roadside structures. Link to the article in *Federal Computer Week*: http://www.fcw.com/fcw/articles/2003/0908/web-dot-09-10-03.asp. Courtesy of the Transportation Communications Newsletter.

Conservation Banking for Wildlife Protection

Several improvements planned to Interstate 10 in California will impact the habitats of two of the state's species of concern. Instead of creating separate conservation plans at the site of each improvement, the agencies involved are using a concept called conservation banking. Large areas of land are set aside to protect habitats for species that may be threatened elsewhere in a region. Conservation banks provide greater environmental benefits at less cost, and can streamline environmental permitting and review processes. See http://environment.fhwa.dot.gov/strmlng/newsletters/sep03nl.htm.

Software Updates Make GPS Surveying System Setup Easier

New features for two GPS reference station software packages will make it easier for users to set up and maintain GPS surveying and positioning systems. Trimble's enhancements to its GPSBase and GPSNet software include more data communication formats, improved data flow and data management tools, and improved modeling techniques, which will lead to higher accuracy, improved productivity and increased confidence in data. See http://biz.yahoo.com/prnews/030917/sfw102_1.html.

Ohio DOT Honored for Environmental Efficiencies

Ohio DOT recently received an AASHTO award for the partnership it created with FHWA and the Ohio State Historic Preservation Office, streamlining required environmental reviews for construction projects and eliminating redundant processes. The partnership has reduced time spent on environmental issues by an average of four to six months on large projects. See http://www.dot.state.oh.us/news/2003/09-17-03.htm.

Design Code Changes Recommended After Bridge Collapse

A structural engineering firm investigating the collapse of a pedestrian bridge is recommending changes to state and federal bridge design codes. The October 2002 collapse of a pedestrian bridge under construction in Marcy, N.Y., was due to global torsional buckling caused by improper design, the independent investigation concluded. Read the September 2003 NYSDOT news release at http://www.dot.state.ny.us/news/2003/marcy_brdg.html.

Designing Around Historic Sites

The proceedings of the National Forum on Assessing Historic Significance for Transportation Programs, held May 23 to 25, 1999, in Washington, D.C., are now available online on the TRB Web site. The report includes panel presentations on historic significance and problematic historic properties, and states' experiences with these issues. See http://gulliver.trb.org/publications/circulars/ec055.pdf.

Construction and Materials Innovations

Quality Assurance for Structural Materials

A new TRB Research Results Digest examines the state of quality assurance for critical structural materials and components—those for which failure poses a threat to public safety or to the integrity of the transportation system (e.g., bridge girders, bridge columns and sign/signal/luminaire supports). http://gulliver.trb.org/news/blurb_detail.asp?id=1838

Industry Group Announces Asphalt Developments

The Asphalt Pavement Alliance has begun to promote its "new asphalt," the name given to hot-mix asphalt using the most up-to-date specifications and techniques, including Superpave and stone matrix designs. For a brochure and links to technical articles, go to http://www.asphaltalliance.com/.

Research Journal Devotes Issue to Concrete and Asphalt

The October issue of the *Journal of Materials in Civil Engineering* focuses on concrete, asphalt and alternative materials for structures and pavements. Highlights include articles on bitumen and crumb rubber interaction, rice-husk ash in cement, compressive resistance of carbon fiber cement composites, and effects of mineral admixtures in young concrete. Access abstract at http://ojps.aip.org/dbt/dbt.jsp?KEY=JMCEE7&Volume=CURVOL&Issue=CURISS.

Ground-Penetrating Radar Equipment Tested for Bridges and Pavements

FHWA's *Research & Technology Transporter* reports that the next generation of ground-penetrating radar is now being field tested. The ultra-wideband, high-frequency GPR system called PERES II (Precision Electromagnetic Roadway Evaluation System) – designed and constructed by Lawrence Livermore National Laboratories – may have application in evaluating both bridge decks and asphalt pavements. See http://www.tfhrc.gov/trnsptr/aug03/.

Relieve Bridge Fatigue Without Stopping Traffic

A quiet, handheld, eight-pound ultrasonic emission device treats welds on bridge socket joints and cover plates, preventing fatigue cracking in welds in a tenth of the time that retrofitting requires. Read the article on ultrasonic impact treatment in the July issue of *Focus*, http://www.tfhrc.gov/focus/july03/01.htm.

FHWA Seeks Help Honing Bridge Inspection Standards

FHWA is requesting comments on proposals to clarify language and restructure the National Bridge Inspection Standards, according to the Sept. 19 AASHTO Regs Report. Comments must be submitted by Nov. 10. See http://www.transportation.org/publications/HTMLRegs.nsf/ViewItems/2003-43?OpenDocument.

Indiana Raises Project Delivery Speed Limit

Indiana DOT's unique approach to repairing two critical sections of downtown Indianapolis Interstate highways was featured as a showcase project during the September AASHTO Annual Meeting. Closing down the Interstates to accelerate repairs enabled the department to complete the project, known as "Hyperfix," in record time, winning public support. See INDOT's press release for details: http://www.in.gov/dot/div/communications/INDOT_News_Highlight.pdf.

AASHTO Pushes Field Use of Air Void Analyzers

AASHTO is promoting air void analyzers to the concrete industry for field use. Frequently employed in research work, AVAs provide real-time assessments of air entrainment in fresh concrete. On the AVA portion of its Technology Implementation Group Web site at http://www.aashtotig.org/focus_technologies/ava/, AASHTO provides a link to a recent article in an industry newsletter (page 7): http://www.aashtotig.org/focus_technologies/ava/related_documents/dispatcher_08-2003.pdf.

Operating/Optimizing the System

Minnesota Corn Stalks for Hire

Minnesota DOT will pay $1.50 more than the current bushel price for cornstalks that farmers leave standing in their fields to act as living snow fences. One 40-foot-wide, quarter-mile-long snow fence is capable of capturing 11,800 tons of snow, minimizing snow and ice on roads and decreasing removal costs. http://www.dot.state.mn.us/newsrels/03/09/15snow.html

Iowa's Living Roadway Plant Profiler

Beautify a highway, prevent erosion, perk up drivers, reduce roadside mowing, and much more with effective highway plantings. Iowa DOT's recently released roadside management guide contains an impressive collection of plant profiles, including their characteristics and care requirements, along with brief descriptions of how they're used in Iowa's roadside management program. Link to the guide: http://www.testdot.state.ia.us/plant_guide/profiler_order3.htm.

Improve Incident Response with Traffic Talk

The Rhode Island Transportation Management Center documented a dramatic improvement in incident response after a state police trooper was assigned to support traffic monitoring. The study results show that communication between the highway agency and incident responders is critical to effective freeway traffic management. Link to the article: http://gulliver.trb.org/publications/trnews/rpo/rpo.trn219.pdf. Courtesy of FHWA's *Technology Talks* newsletter.

Safer Work Zones with Intelligent Safety Barrels

New research is under way at the University of Nebraska-Lincoln to develop a robotic highway safety barrel that can self-deploy and self-retrieve, removing workers from in-traffic danger. The barrels could continuously follow crews to maintain proper safety limits. See description at http://robots.unl.edu/projects/ and contact the investigator, Dr. Shane Farritor, at sfarritor@unl.edu.

Successful Sign Management Within Reach

According to a recent discussion on AASHTO's Transportation Asset Management Today discussion Web site, several options are available for sign management systems, including Michigan's RoadSoft software (see http://www.roadsoft.org/), Mastermind Systems' SignMaster module (see http://www.mastermindsystems.com/signmstr.html) and a North Dakota research project using GPS and an IPAQ handheld. See the full discussion: http://assetmanagement.transportation.org/tam/aashto.nsf/54be0d40ec7fbeae852568fc006f6b21/e2f597b17f0b190b85256d7400688647?OpenDocument

'Seeing Spots' Reduces Rear-End Collisions

Engineers at Pennsylvania DOT have found that painting large "dots" on the roadway to give drivers an easy way to measure safe driving distances can dramatically reduce the number of rear-end collisions. On Route 11, where the program was first tried, the state transportation department reported a 60 percent reduction in rear-end collisions in the six months after the dots were painted. Link to MSNBC story: http://www.msnbc.com/local/wbre/PensylvaItr.asp?cp1=1.

Reduce Crashes by Taking the Driver Out of Driving Decisions

A University of Minnesota research team is developing a system to reduce crashes caused by driver error as vehicles enter a highway from a rural collector road. The system employs a network of radar detectors, installed along the highway leading up to the intersection, which communicate with a central data processor using wireless networking technology. The central processing unit evaluates gaps between vehicles coming down the highway and warns drivers on the collector road if there is not enough room to enter the highway safely. Link to the article at the University of Minnesota Center for Transportation Studies: http://www.cts.umn.edu/publications/enews/2003/04/Enewsv1n4_full.html#IDS.

Safe Travel/Smart Travel

U.S. DOT Launches New Web Site on Fatality and Injury Data

Three U.S. DOT Administrations have joined to provide recent traffic safety data in one place. Information is organized under state-specific and national categories, such as safety belt use, toll of crashes, overviews and trend charts.
See http://www.nhtsa.dot.gov/people/Crash/crashstatistics/index.htm.

Will Wi-Fi Cut Costs of Deploying ITS?

States spend millions of dollars each year building or extending existing ITS infrastructure. The Virginia Tech Transportation Institute is evaluating wireless fidelity (Wi-Fi) networking and satellite communications technology from SiriCOMM, Inc., that could be used in place of fiber networks to enable continued ITS growth at greatly reduced costs. Courtesy of the Transportation Communications Newsletter: http://biz.yahoo.com/prnews/030905/cgf024_1.html.

Testing PCS for Traffic Signal Control Systems

A project of the Enterprise Program pooled fund project will test the use of next-generation wireless digital personal communication services (PCS) for application to urban traffic control systems. If proven viable, this communications technology could be applied to remote monitoring of a wide range of ITS components, including dynamic message signs, RWIS and vehicle detection/count stations, to reduce costs and installation time in rural ITS applications.
http://enterprise.prog.org/current/pcs.htm

511 Project Would Standardize Amber Alerts

Building on their experience in developing the Condition Acquisition and Reporting System (CARS) and then "CARS-511," eight states are again collaborating in a pooled fund effort to help develop Web-based tools for managing the creation, approval and dissemination of Amber Alert messages. The CARS-Amber technology relies heavily on available ITS standards, opening the effort to new "non-CARS" participants as well. From the newsletter of the ITS Cooperative Deployment Network: http://www.nawgits.com/icdn/cars_amber.html.

Microwaves at Heart of Work Zone Information System

Kentucky's TIPS system uses roadside microwave sensors located on portable message signs ahead of and along highway construction zones to collect real-time traffic flow data and send it by microwave to a computer that calculates travel times. From ITS America News:
http://www.itsa.org/ITSNEWS.NSF/4e0650bef6193b3e852562350056a3a7/67c9244173ee1f5e85256d9500436be8?OpenDocument.

Dynamic Route Clearance for Emergency Vehicles

Improving the quality of emergency services that rely on surface transportation systems is among the most important goals of ITS research. At the University of Minnesota's Intelligent Transportation Systems Institute, researchers are exploring dynamic route clearance for emergency vehicles, a technology that promises to reduce emergency response times while minimizing traffic disruption for other motorists.
http://www.its.umn.edu/sensor/2003/spring/signals.html

Now Open: Roadway Detector Evaluation Facility

Thousands of roadway detectors throughout California make up the state's ITS infrastructure. The resolution, accuracy and cost-effectiveness of these detectors are critical. To meet the need for quality data, and to evaluate the increasing number of available roadway detector technologies, Caltrans and California Partners for Advanced Transit and Highways have developed and deployed a detector evaluation facility that quickly and automatically determines the operational accuracy of traffic detectors with unprecedented accuracy.
http://www.path.berkeley.edu/PATH/General/WhatsNew/102302/WhatsNew102202b.html